**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA**

**CONFIDENTIAL--TO BE FILED UNDER SEAL
SUBJECT TO PROTECTIVE ORDER**

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	**Case No. 07-CV-5944-JST**
	MDL No. 1917
THIS DOCUMENT RELATED TO:	
ALL DIRECT PURCHASER ACTIONS	

REPLY EXPERT REPORT OF PHILLIP M. JOHNSON, PH.D.

March 4, 2022

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I.   Introduction

1.   I am the same Phillip Johnson who previously provided a report in this matter.[1] I
have been asked by counsel for Direct Purchaser Plaintiffs ("DPPs") to review
Defendants' Class Certification Opposition[2] and respond to the claims it made
relating to the opinions in my report.

2.   A list of materials I have relied upon in preparation of this reply report (in addition to
those referenced in my Opening Report) is in **Exhibit 1**. I have relied on the best
information available to me at the time of the preparation of this report. I reserve the
right to consider any further relevant evidence that might emerge and to supplement
or amend my conclusions as necessary.

3.   I began work on the economic analysis of class, damages, and merits issues for the
CRT Antitrust Litigation in April 2010, when Econ One was initially retained on this
matter. I initially worked with Jeffrey Leitzinger on his analysis in the earlier reports
in this matter. I worked closely with him on the analysis in those reports, leading his
team and assisting with his preparation of every report and each analysis. Between my
work on this DPP case against Irico and the earlier DPP case against other
participants in the CRT cartel, I have worked on the CRT cartel case for more than
1,500 hours over the course of nearly 12 years. This work includes my report as well
as every aspect of every analysis done for the prior reports submitted by Dr.
Leitzinger. Thus, I participated in the development of Dr. Leitzinger's analysis for his
opinions. In other words, to the extent my opinions and words overlap with Dr.
Leitzinger, it is because I also hold those opinions and believe those words most
effectively express my own opinions.

4.   Below, I summarize the claims in the Defendants' Opposition that are relevant to my
opinions, as well as my responses to each. I stand by the analysis and conclusions I
presented in my Opening Report.

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[1] Expert Report of Phillip M. Johnson, November 19, 2021. ("Johnson Report" or "Opening Report")

[2] Irico Defendants' Opposition to Direct Purchaser Plaintiffs' Motion for Class Certification with Respect to
the Irico Defendants, January 21, 2022. ("Defendants' Opposition")

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a.   **Claim:** Irico claims that my analysis of target prices does not show class-wide impact because it does not show that target prices were effective in raising actual prices. First, Irico argues that shipments of products for which documentation of target prices were not found were not impacted because they have not been shown to have been targeted. Second, Irico attempts a statistical critique of my regression analysis, claiming that I did not account for a possible spurious relationship between actual and target prices.

Response: Irico's claim that the only products impacted are those for which a document was found with a price target is incorrect. As I have described in my Opening Report and my deposition, the conspirators utilized a range of collusive activities that encompassed all CRT production and, consequently, had the effect of elevating all CRT prices. Irico's statistical critique of my target price regression also has no basis. My regression model is estimated in an error-correction form and includes supply and demand controls, as well as a general time trend variable, which account for a potential spurious relationship. Therefore, as I opined in my Opining Report, my target price regression showing that target prices were effective in raising actual prices is reliable.

b.   **Claim:** Irico claims that manufacturers did not have sufficient flexibility in production lines to the type of price relationships across various CRT sizes and types that give rise to common impact, as described in my report.

Response: Irico's claim is factually wrong. As I described in my Opening Report, manufacturers were able to adjust production across CRTs with different features to more profitable CRTs. In response to Irico's critique that I have relied on weak evidence, I describe additional evidence from co-conspirators' actual production line status reports showing that production lines were typically designed to manufacture a range of CRT sizes. I also describe evidence of production line conversions from one CRT size/type to another CRT size/type. Discussions in cartel documents also show that manufacturers were indeed able to switch between CRT products, as needed.

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      c.   **Claim:** Irico claims that my hedonic regression does not show a price structure because there is variation in the R-square values and alleges that my opinion relies on an average of the R-square values.

              Response: Irico's claim is wrong. I presented every R-square resulting from the quarterly regressions and described how the results from the 104 regressions provided strong support for my conclusion that CRT characteristics explain the vast majority of the variation in prices.

      d.   **Claim:** Irico claims that my overcharge analysis is not capable of measuring damages due to the alleged harm because: "(1) it covers products that were never subject to the alleged conspiracy; (2) assumes but-for pricing that does not factor in mandatory price floors implemented by the Chinese government during the class period; and (3) covers years for which Irico could not be liable given their limited participation in any alleged conspiracy."[3]

              Response: Irico's claims are unfounded. Regarding claim (1), Irico's claim disregards that target prices were not the only tactic the cartel used to elevate CRT prices. Regarding claim (2), Chinese regulations, which Irico claims to have established "price floors," have no bearing on the reliability of my overcharge model and its ability to provide a reliable measure of class-wide damages. Regarding claim (3), My model provides a reliable measure of class-wide damages for any subperiod of the Class Period. Moreover, I am informed by counsel that evidence of Irico's participation in the conspiracy from its outset in 1995 has recently been discovered.

II.   Irico's Claim that the CRT Cartel's Anticompetitive Conduct Would Only Have Impacted Some CRTs is Incorrect

5.   Irico claims that my analysis of the CRT cartel's target prices does not show class-wide impact. They present two claims. First, Irico argues that my analysis showing the share of shipments of targeted products is misleading because it counts shipments of targeted CRTs in periods in which no conspiracy documents were produced listing

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[3] Defendants' Opposition, 22.

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target prices for these specific CRTs.[4] Second, it argues that my target price regressions do not show that the cartel's target prices were effective in raising actual prices because the outcome of my regression "simply means that target prices and actual prices tended to move in the same direction" and my regression is not capable of showing "target prices *caused* an increase in actual prices."[5] As I explain below, these claims are misleading and mischaracterize my analysis, opinions, and testimony.

A. The Cartel Utilized Multiple Tactics that Were Effective in Elevating All CRT Prices during the Class Period, Not Just Those with Explicit Price Targets

6.   As a general matter, Defendants' Opposition gives a misleading impression target pricing was the "core" (if not sole) mechanism by which the conspiracy operated to elevate CRT prices and that an explicit price target was necessary for a CRT price to be impacted.[6] This is incorrect, both as characterization of Plaintiffs' allegations[7] and as a matter of the evidence I reviewed and discussed in my Report. While CRT price targeting was an important part of the conspiracy's operation, it was not the only mechanism. Defendants and co-conspirators utilized a range of activities that covered all CRT production and had the effect of elevating all CRT prices.

7.   In my Opening Report, I described the operations of the conspiracy, including capacity and production controls. Conspirators explicitly agreed to curtail capacity by slowing production or shutting down production lines entirely. In my report, I summarized 186 documents recording apparent collusion on output and capacity as well as exchanges of information relating to jointly managing and reducing output and capacity.[8] As an economic matter, curtailing output tends to result in higher prices for all products for which the output was reduced as well as products which

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[4] Defendants' Opposition, 14-17.

[5] Defendants' Opposition, 17.

[6] "The core of DPPs allegations is the claim that manufacturers met to fix the prices of CRTs, reflected in the price targets identified by Dr. Johnson." Defendants' Opposition, 22.

[7] Direct Purchaser Plaintiffs' Consolidated Amended Complaint, March 16, 2009 ("Complaint"), 31.

[8] Johnson Report, 26-30, 73-76.

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are substitutes for those products.[9] The CRT conspirators understood the effect of production restraints on prices of products, both for the products for which output was restricted, as well as other products. As discussed in my Report, conspiracy documents show that conspirators also used output controls to maintain or elevate price levels without expressly setting or changing price targets. For example:

> Based on the conclusions of the CPT/SDI/LG CEO meeting and the discussion of GSM meeting, plan to stop the production of 30% of the current production lines for one year in order to effectively decrease capacity and control prices.[10]

> Capacity control (17" CDT): Up to now, the capacity adjustment for 17" CDT's has been proceeding smoothly as a result of cooperation among the companies. In June, 17" CDT production will stop for 5 days (25 operating days) to adjust the actual production volume in order to maintain the price level.[11]

> Especially, in the case of the price of 14" monitors, Philips and Chunghwa are trying to adhere to the agreed upon price by reducing the utilization rate…[12]

8. Accordingly, impact resulted from the collection of cartel activities, not just price targeting. Further, it is far from clear that all price targeting was reflected in the set of cartel notes that were located, as Irico's argument assumes. I explained the flaw in this presumption in my deposition.[13] Irico incorrectly claims that the analysis in my report at most shows impact on those products for which a document was found with a price target.

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[9] Hal R. Varian, *Intermediate Microeconomics: A Modern Approach: 8th edition* (New York: W.W. Norton & Company, Inc., 2010), 111, and 455.

[10] CHU00660306E-CHU00660311E at 309E.

[11] SDCRT-0086632E-SDCRT-0086633E at 632E.

[12] SDCRT-0086449E-SDCRT-0086454E at 449E.

[13] Deposition of Phillip M. Johnson, January 11, 2022, 230:8-231:16. ("Johnson Deposition").

B. The Cartel Also Directly Targeted Prices of All the Major CRTs

9.   My analysis of the effectiveness of target prices was facilitated by the fact that the target prices were quantifiable and readily susceptible to testing of their influence on transaction prices. As I explained in my deposition, I have identified "certain types of products" which documents showed "were actively and consistently targeted by the cartel members" and "my opinion is that those products were impacted by the price targeting, [which] is in part based upon the target price analysis, and also in part based upon other documents that I have seen and depositions referencing the breadth and the extent of the cartel's price fixing efforts."[14]

10.   In its Opposition, Irico presents a chart that purports to highlight the months of the available documents with explicit target prices and argues that the existence of "gaps" in-between months without target price documents refute my conclusion of class-wide impact.[15] The chart presented in the Opposition is inaccurate and misleading in several respects.

11.   First, I note that the 34" CPT, displayed in Irico's chart with only one target price document, was not one of the CRTs I included as targeted in my calculation of the share of sales that were of products with price targets.[16]

12.   Second, the chart does not accurately illustrate the existing documentation of price targets. For example, the chart shows several gaps for 14" CPT from 1999 through 2001, implying that there were no targets set for those "gap" periods. This is wrong because it ignores target prices which were set for the period starting in the second quarter of 1999 through 2001.[17] Similarly, the chart shows multiple gaps for several CPT sizes (15", 21", 25", 28", 29", and 32") between 2003 and 2005. This is wrong because it ignores price guidelines for these CRTs set for each quarter of that

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[14] Johnson Deposition, 169:24-170:11.

[15] Defendants' Opposition, 15, 22. Irico claims that this chart was created using the dataset provided in work materials with my Opening Report. Irico did not provide backup materials with the process generating this chart.

[16] See Johnson Report, 32.

[17] See SDCRT-0086512E-SDCRT-0086513E, where conspirators set price guidelines for 14" CPT for "the second half of 1999," "the first half of 2000," and "the second half of 2000."

period.[18] Similarly, the chart shows gaps for 14", 20", and 21" CPTs during 2001, which ignores relevant price targets for that period.[19]

13. Third, as I described in my report, price targets influenced transaction prices beyond the initial month or quarter for which they were set.[20] This is because 1) conspirators often set prices, not for a specific month but for a quarter or several quarters in advance,[21] 2) price targets were often set in relation to prior actual or target prices,[22] and 3) there was a persistent effect on CRT prices such that elevation of CRT prices in one period would continue to impact CRT prices afterwards.

14. The target price regression analysis confirms that the influence of target prices on actual prices went beyond the immediate quarter. Utilizing the results of my previously conducted target price regression model, I determined that target prices had a positive effect on prices well into the future. Indeed, as shown in Figure 1, the estimated impact is substantial enough to remain statistically significant even two quarters beyond the initially effective quarter.[23] Thus, even if a gap in the documents indicates a gap in price targets (as opposed to just a gap in documents of price

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[18] See e.g., SDCRT-0087934E-SDCRT-0087937E at 935E and SDCRT-0088720E-SDCRT-0088725E at 721E setting price guidelines for each quarter of 2003; MTPD-0580737-MTPD-0580740 at 740, MTPD-0580751E, and MTPD-0607598 setting price guidelines for each quarter of 2004; MTPD-0580798, SDCRT-0002984 and MTPD-0423645 setting price guidelines for each quarter of 2005.

[19] See e.g., SDCRT-0087662E setting prices for the entire 1st half of 2001 for 20" and 21" CPTs, SDCRT-0087667E setting prices for Q3 of 2001, and SDCRT-0087312E-SDCRT-0087313E at 312.01E, CHU00031113E-CHU00031114E at 114E, and CHU00036414E-CHU00036415E at 415E setting prices for the 1st, 2nd, and 3rd quarters of 2001 for 14" CPT.

[20] Johnson Report, 33, 40.

[21] See e.g., SDCRT-0086512E-SDCRT-0086513E, setting price guidelines for "the second half of 1999," "the first half of 2000," and "the second half of 2000;" SDCRT-0087662E setting prices for the entire 1st half of 2001; SDCRT-0005831-SDCRT-0005842 at 840, MTPD-0607571E, and MTPD-0580726 setting prices for two quarters ahead; and CHU00029175.01E-CHU00029178.02E at 178.01E, "agreed that at the next *meeting* to review the prices for each quarter of *Year* 2000."

[22] See e.g., CHU00029152E-CHU00029154E at 154E; SDCRT-0090197E.

[23] These computations are based on the target price regression coefficients presented in Figure 10 of my Opening Report. I did not perform any new target price regressions.

targets), and even if one incorrectly assumes that impact only comes through price targets, it is incorrect to claim that products were not impacted during that gap.

Figure 1: Target Prices Affected Actual Prices Beyond the Immediate Period

	Target Price Effect Estimate			
	CDT		CPT	
Period	Estimate	T-Value	Estimate	T-Value
(1)	(2)	(3)	(4)	(5)
Target Price Quarter	0.65 ***	8.28	0.12 **	2.09
Target Price Quarter + 1	0.19 ***	3.59	0.28 ***	3.28
Target Price Quarter + 2	0.04 **	2.01	0.05 **	2.11

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

15.   In addition, as I explained in my report, the price target data that I was able to construct from available historical documents likely understates the full extent of price targeting.[24] For example, there are conspiracy documents that show schedules for prior and upcoming meetings for which no records were produced.[25] Others lacked sufficient clarity in target price information to be utilized in the analysis.[26] Irico emphasizes that my analysis did not utilize any target price records for 29" CPTs between 1999 and 2003.[27] However, several conspiracy documents show evidence of that size being targeted during this period and also include discussions of prices and capacity restraints.[28]

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[24] Johnson Report, 31.

[25] See e.g., CHU00029105E-CHU00029107E at 107.01E, SDCRT-0087312E-SDCRT-0087313E at 313E, SDCRT-0086593E-SDCRT-0086596E at 593E, CHU00030458E-CHU00030462E at 460.02E, and SDCRT-0086416E-SDCRT-0086418E at 418E.

[26] See e.g., SDCRT-0086238E-SDCRT-0086240E at 240E discussing prices of various CRTs, including 29" CPTs in 1997.

[27] Defendants' Opposition, 15.

[28] See e.g., SDCRT-0087694E-SDCRT-0087698E, showing price and capacity guidelines for 29", 25", and 21" CPTs in 2001; SDCRT-0007580, showing price plan discussions for 29" and 25" CPTs in 2000; CHU00029214-CHU00029220 at 216, showing discussions of production stoppage for 29" CPT in 1999; SDCRT-0087437E-SDCRT-0087440E at 440E, showing discussions of 29" CPT capacity in 2001.

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16.   Irico also overstates the significance of the products that do not have documented price targets by failing to account for the lower volume of sales during periods when no target prices were found. For example, Irico's chart shows that no price targets were found for 14" CDT beyond the end of 2001. However, by the fourth quarter of 2001, the sales of 14" CDT had steeply declined. Shipments of 14" CDTs after 2001Q4 accounted for roughly 0.4% of 14" CDT shipments during the Class Period. Similarly, while Irico's chart indicates that only one price target was found for 17" CDTs between 1995 and mid-1997, it fails to note that sales of 17" CDTs in this period were limited, accounting for less than 3% of the 17" CDT shipments during the Class Period. Overall, shipments in the period between the first and last identified target price document, depicted in Irico's chart (excluding 34" CPT), account for over 75% of CRT shipments (81% of CDT shipments and 71% of CPT shipments) during the Class Period. Furthermore, the share of CRT shipments during the Class Period excluding the periods prior to the first identified target price document is over 87% (94% of CDT shipments and 82% of CPT shipments).

17.   Lastly, Irico references an analysis conducted by Robert Willig, submitted with his 2013 expert report. Irico says: "Dr. Robert Willig determined that the alleged target prices applied to 'at most only 6% of CDT shipments and 24% of [CPT] shipments during the class period'"[29] These numbers are far from accurate for describing the extent of price targeting by the conspiracy, which I analyzed in my report. This can even be seen by examining Irico's own chart.[30] It is implausible that the continuous price targeting of all major CRTs that is depicted in Irico's own chart (notwithstanding its flaws, as I described) translate to merely 6 percent of CDT shipments and 24 percent of CPT shipments.

18.   I reviewed Dr. Willig's report materials related to these computations. I found that they are misleading and unreliable for several reasons.

        a.   The dataset utilized in Dr. Willig's 2013 calculations contains only a portion of the documents and target prices used in my analysis. Specifically, the dataset

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[29] Defendants' Opposition, 16. The statement in the Opposition has an apparent typo, stating "24% of CDTs" which should be "24% of CPTs."

[30] Defendants' Opposition, 16.

used by Dr. Willig contains only 164 documents and roughly 3,000 records, while the dataset used in my analysis contains 237 documents and over 4,200 records.[31]

b.   Dr. Willig makes an error by only including price targets which specifically referenced an ITC/Bare characteristic. For example, if a price target was set for a 14" CDT Bare he included it in his computations but if the price target referenced 14" CDT generally, he did not. This error excluded nearly half of the target price records from his analysis.[32]

c.   In making this error, his analysis presumes, for example, that a price target for a CDT 14" Bare (or ITC) cannot and does not effectively function as a price target for the ITC (or Bare) version of that size (even if no explicit price differential is mentioned). Numerous conspiracy documents, which I also cited in my report, showed that price targets for ITC (or Bare) configuration were regularly set based on their Bare (or ITC) configurations.[33]

d.   He also makes an error in counting only target price records with an effective quarter, ignoring target prices which did not have an identified effective quarter.[34]

e.   Dr. Willig also ignored that price targets would impact prices beyond the immediate quarter. As I showed above, it is not appropriate to assume the effect of target prices is limited only to the period in which they were first effective.

f.   Finally, he ignores the effect of other collusive conduct on prices, such as output limitations, which worked in conjunction with target prices to elevate

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[31] Backup materials to Expert Report of Robert Willig, September 10, 2013 ("Willig Backup"), "crt_target_prices.dta."

[32] Willig Backup, "Paragraph 22.do."

[33] See e.g., CHU00031174.01E-CHU00031175.02E at 175.01E; CHU00031240.01E-CHU00031247E at 245E; CHU00029152E-CHU00029154E at 153E-154E; SDCRT-0090197E.

[34] For example, CHU00028691.01E-CHU00028693E, at 692E-693E (17" CDT in 1997), CHU00028725.01E-CHU00028727E, at 727E (14" CDT in 1997).

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prices even if no explicit price targets were set for those products or in those periods.

C. My Analysis Showed the Effectiveness of the Target Prices in Raising Actual CRT Prices

19. Irico claims that my target price regression merely reflects a common downward movement of target and actual prices – not a causal relationship. Moreover, it claims that I "admitted" to this being the case.[35] The Opposition states: "What DPPs are seeking to show here – that target prices *caused* an increase in actual prices above the competitive level – is simply not something that Dr. Johnson's regressions are capable of showing, as he admits." This is a mischaracterization of my opinion and testimony.

20. First, Irico selectively quotes from my report to imply that I only found "evidence of a positive relationship" between target prices and actual prices and claims I acknowledge that this merely shows a correlation between the two prices.[36] Irico does not quote the full sentence from my report, which states: "The results reveal statistically strong evidence of a positive relationship between target prices and actual prices, <u>separate and apart from the effects of other market factors</u>."[37] As I testified, a positive correlation can be supportive of a causal relationship,[38] and this is particularly the case when that relationship is found to hold "separate and apart from common market factors." Moreover, Irico ignores my related statement in the report in the summary of opinions that "Regression analysis showing that 'Target Prices' established through the alleged conspiracy had a <u>demonstrable effect</u> on actual prices paid."[39]

21. Irico also mischaracterizes my deposition testimony in this regard stating that: "Contradicting DPPs claim, Dr. Johnson admitted that 'even high degree of

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[35] Defendants' Opposition, 17.

[36] Defendants' Opposition, 17.

[37] Johnson Report, 34 (emphasis added).

[38] Johnson Deposition, 103:8-16.

[39] Johnson Report, 4 (emphasis added).

correlation' – which is all he purports to find here – 'does not imply a causal relationship'." This mischaracterizes my testimony because the question asked to me was a general concept question of whether high correlation in and of itself implies causation, without a reference to the target price regression analysis.

> Q: Isn't it true that even a high degree of correlation does not imply a causal relationship?
>
> A: I would agree with that. I would just add that observances of high degrees of correlation can be supportive of there being a causal relation. Also, it can depend upon the nature of the correlations you examine. But in and of itself, correlation isn't causation."[40]

22.   Further, Irico attempts to criticize my target price regression on statistical grounds stating: "Dr. Johnson does not perform any of the basic and customary tests available to economists to test for, and weed out, *spurious* correlations from regression models – that is, correlations that reveal nothing about an actual relationship between the two variables being tested because they 'are related only through their correlation with an omitted variable...' '[C]ommon econometric technique[s],' such as error correction models and use of first differences, are available to address and minimize these concerns with regression analysis of time-series data, but Dr. Johnson conspicuously made no use of any such techniques."[41]

23.   This reflects a fundamental misunderstanding (or misrepresentation) of econometrics and my analysis. My regression model, in fact, does what Irico claims it not to do. The regression model is, indeed, estimated in an error-correction form and includes controls that account for the possibility of a spurious relationship. Therefore, there is no basis for this criticism.

24.   As a statistical matter, I recognize that a regression (or correlation) of one non-stationary time series on another might produce a spurious relationship, i.e., an

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[40] Johnson Deposition, 103:8-16.

[41] Defendants' Opposition, 17-18.

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estimated relationship that arises solely from common time-series patterns, instead of actual economic relationships. Therefore, a test of stationarity is sometimes conducted to check for this possibility. If time series variables exhibit non-stationary patterns, and there is a concern for spurious relationships, one way that's been proposed to address this is to conduct the analysis in first differences (i.e., price changes). In my Opening Report, I explained why conducting this analysis in price changes is not the correct approach.[42] A superior approach is to perform the regression in an error-correction form, which includes the levels of current and past prices.[43] This is the approach I took, which is an appropriate and prudent approach, whether the series exhibit stationarity or not.[44] An *a priori* test of stationarity is simply not necessary when estimating a regression in this form.

25.   Additionally, the supply and demand controls that I included in the model account for the possibility that the positive effect of target prices on actual prices might be explained by supply and demand factors. Moreover, one of the variables I included is a trend variable which controls for the possibility of a common downward trend in actual and target prices that is not captured by other supply and demand variables.

26.   Concerns that an estimated relationship may be spurious are more plausible when relationships between the variables being studied do not have a well-understood economic rationale.[45] In the current case, however, there is a well-documented and an economically plausible relationship between target prices and actual prices. That is that the sole purpose of conspirators' extensive multi-year effort to meet and coordinate on specific product prices was to influence actual market prices.

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[42] Johnson Report, 40.

[43] See the literature referenced in my Opening Report discussing why this approach is superior to analyzing price changes. Johnson Report, fn. 139.

[44] As I have described, my target price regression includes actual prices for the past quarter, as well as current and past quarter target prices. This is one of the ways of formulating an error-correction regression. See e.g., Suzanna De Boef and Luke Keele, "Taking Time Seriously," *American Journal of Political Science* 52, no. 1 (January 2008), 184-200.

[45] For example, whether individual risk aversion is correlated with wealth. See e.g., Travis J. Lybbert and David R. Just, "Is Risk Aversion *Really* Correlated with Wealth? How estimated Probabilities Introduce Spurious Correlation," *American Journal of Agricultural Economics* 89, issue 4 (November 2007), 964-979.

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27.   In sum, I stand by my opinion that the relationship I found between target and actual prices reflects the successful efforts of Irico and its co-conspirators to raise actual prices.

D. My Analysis Showed that Products for Which Target Prices Were Not Found Were Also Impacted

28.   Irico contends that my correlation analysis showing the relationships between prices of targeted and non-targeted products has "serious flaws" because it masks "substantial variation" in correlation across sizes.[46]

29.   Contrary to Irico's claim that my analysis "masks" variation across sizes, I presented in my report correlations for each size. As I described, the results show that 13 out of 18 CRT sizes have positive correlation above 0.8.[47] It is clear from the associated figure that these sizes account for nearly all sales of non-targeted products. The sizes with negative correlations or correlations below 0.8 are sizes with the lower volume of sales, representing merely 2.5% of non-targeted product sales and less than 0.5% of all sales between 1995 and 2007. Lower or negative correlations for these low-volume sales do not suggest that those products were immune from the impact of the conspiracy but are, instead, likely the result of limitations in those data inhibiting the ability to accurately detect the relationships between those prices and the prices of other products.[48] Moreover, in evaluating whether the impact was widespread, it would be a mistake to give an equal weight to the high-selling products and low-selling products. The quantity-weighted average correlation is, therefore, the most appropriate way to summarize the evidence with respect to the question at-issue.

30.   Irico also contends that the correlation analysis is "unreliable" because it does not control for spurious correlations. Correlations are well-accepted in analyzing price relationships. They can also be supportive of causal relationships, as I explained in my

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[46] Defendants' Opposition, 19.

[47] Johnson Report, 41.

[48] For example, CPT 39" prices, which show a negative correlation, are based on a single product model which shows an apparent outlier spike in 2002 Q2.

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deposition.[49] As I have also described, there are clear and well-understood economic frameworks that explain how cartel price-fixing in an industry with products with supply and demand substitutability can be expected to impact all those products, thus giving rise to meaningful relationships between the prices of different sizes and types. Therefore, it is nonsensical to presume that prices of various related products are unrelated and that the high correlations are merely spurious relationships.

III.   Irico's Claim that My Analyses Failed to Show Class-Wide Effect of the Conspiracy is Incorrect

31.   In my Opening Report, I discussed documentary evidence and several analyses I conducted that led to my conclusion that the alleged conspiracy had a widespread class-wide impact.[50]

32.   Irico criticizes one aspect of my discussion, regarding supply-side substitution and price relationships across CRT sizes. Irico says: "Dr. Johnson simply ignores these demand factors *entirely* and lumps all products together in evaluating the critical question of whether there was common impact on customers… He instead relies only on selective and stunningly weak supply-side considerations (i.e., CRT manufacturers' ability to switch between manufacturing different sizes and types) for his 'price structure' theory, quickly surmising that pricing of all CRT sizes and types were inextricably interrelated, and thereby opining on class-wide impact."[51]

33.   First, Irico is simply wrong in its claim that I lump "all products together in evaluating the critical question of whether there was common impact on customers." My evaluation of evidence included analyses of prices by CRT types, sizes, geographic regions, and customers. Moreover, I specifically examined statistically whether there was evidence of impact on individual customers and found evidence of impact for customers that accounted for nearly all purchases.[52]

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[49] Johnson Deposition, 103:8-16.

[50] These are summarized in pages 3-4 of my Opening Report.

[51] Defendants' Opposition, 20.

[52] Johnson Report, 54-57.

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34.   With respect to product substitution and price relationships across CRT sizes, Irico is
        also wrong to say that I rely "only on selective and weak supply-side considerations."
        I described deposition testimony of senior cartel employees on the relationships
        between CRT sizes and how they were mindful of these relationships in their
        pricing.[53] I confirmed my expectation of price relationships statistically with an
        analyses of correlations between the various CRT sizes and CRT types.[54] In
        opposition, Irico claims that production lines were not sufficiently flexible to allow
        manufacturers to switch production across CRT sizes and that the switching of a
        Toshiba production line I referenced, was an exception.[55] As I describe below, Irico's
        claim is contradicted by the evidence in this case.

A. Irico's Claim that Switching Production Between CRT Types and Sizes Was Cost-Prohibitive is Incorrect

35.   In my Opening Report, I explained that there was sufficient flexibility in the
        production side to meet changing demand for different CRT features.[56] Irico makes
        the surprising claim that Toshiba's production flexibility was a "niche production
        capability and contradicts the bulk of the record on the prohibitive cost of converting
        CRT production lines to different sizes or types."[57] Irico says that "[t]he record
        simply does not support [my] supposition that production line 'flexibility' would
        create price relationships across all CRT sizes and types."[58]

36.   Irico's claim is factually wrong. Defendants produced reports on production lines
        about the type of CRTs that were manufactured on each. In Appendix A, I list
        examples of production lines (drawn from those reports) with the documented
        capability of producing more than one size and/or type of CRT. The table lists the
        manufacturer, country and location of the facility, line number, and the CRT types

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[53] Johnson Report, 38-39.

[54] Johnson Report, 40-42.

[55] Defendants' Opposition, 20-21.

[56] Johnson Report, 37-38.

[57] Defendants' Opposition, 20.

[58] Defendants' Opposition, 21.

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produced on the line. For example, the table shows that SDI's Korean Suwon facility had 5 production lines capable of producing a mix of various CDT and CPT sizes, such as Line #2 which produced 17-inch flat, 19-inch flat, 20-inch and 21-inch (flat and round) CDTs; and Line #4 produced 15-inch and 17-inch flat CDTs.

37.   Every co-conspirator had several production lines capable of producing multiple CRT sizes. On some production lines, a range of sizes could be produced. For example, LPD's Korean Gumi facility had a line capable of producing 28-inch, 29-inch, 32-inch and 34-inch CPTs and a line producing 17-inch and 19-inch CDTs.

38.   In Figure 2, I summarize information presented in production line status reports as of November 2001 and 2005.[59] As shown, production lines were able to produce multiple CRT sizes.

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[59] In the backup materials to this report, I included a similar summary for July 2004.

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Figure 2: Production Lines Were Capable of Producing Multiple CRT Sizes

| | | Production Lines Producing More than One CDT or CPT Size | | |
Manufacturer	Number of Total Lines	Number of Lines	Share of Total Lines	Share of Total Capacity
			(3)/(2)	
(1)	(2)	(3)	(4)	(5)
November 2001				
BMCC	5	1	20%	17%
CPT	19	2	11	10
Hitachi	8	4	50	49
LPD	54	15	28	30
MTPD	17	12	71	67
Mitsubishi	8	2	25	15
Orion	9	4	44	43
SDI	28	17	61	55
Thai-CRT	5	4	80	81
Thomson	13	8	62	56
Toshiba	10	5	50	43
Total	**176**	**74**	**42%**	**39%**
November 2005				
CPT	7	2	29%	35%
Hitachi	4	1	25	16
IRICO	9	4	44	44
LPD	35	12	34	30
MTPD	19	14	74	71
Orion	3	3	100	100
SDI	27	20	74	68
Thai-CRT	4	2	50	63
Thomson	12	10	83	85
Total	**120**	**68**	**57%**	**54%**

Notes: (1) Excludes lines which the status reports indicated were inactive.

Source: CHU00125257, BMCC-CRT000006384.

39.   Some manufacturers also had lines capable of producing both CDTs and CPTs. For example, SDI had at least 5 production lines capable of producing both CDTs and CPTs on the same line: Line #1 in Suwon, Korea, had capacity to produce 10-inch CDTs and CPTs; Line #1 in Busan, Korea, had capacity to produce both 19-inch

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CDTs and 21-inch CPTs; Line #4 in Sembilan, Malaysia, had capacity to produce 14/15-inch CPTs and 14-inch CDTs; Line #1 in Manaus, Brazil, had capacity to produce 20-inch CPTs and 17-inch CDTs; Line #2 in Manaus had capacity to produce 14-inch CPTs and 14/15-inch CDTs.[60]

40.   Further, there are many examples of manufacturers converting production lines from producing one CRT size/type to another CRT size/type. For example, in 1999, SDD converted its 20- and 21-inch CPT line in Pusan to produce 19-inch CDTs and 21-inch CPTs and converted its 20- and 21-inch CPT line in Mexico to produce 25- and 27-inch CPTs instead. Similarly, LPD converted half of its UK production of 20- and 21-inch CPTs to produce 15-inch CDTs.[61] LPD also converted one if its Korean 14-inch CPT production lines to a 14- and 15-inch CDT line.[62] Thai-CRT converted its CDT line to CPT.[63]

41.   Clearly, switching production across different CRT sizes and types was not the "cost-prohibitive" process, as Irico claims. Indeed, many conspiracy documents discuss how manufacturers were able to switch production between CRT types in response to changing demand conditions. For example:

> SSD explained that BMCC currently has one mix line of 14" CPT/CDT that is producing 1.2M/Y, 14" CPT approximately 500 k/y, except that in July or August, it stopped producing 14" CDT and converted that portion to produce CPT.[64]

> Because of the falling demands of customers, [MTPD's] Thai factory's shared line for 15"F/21"F strategically produced more 21"F.[65]

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[60] CHU00125257.

[61] CHU00029179.01E-CHU00029184E at 179E.02E.

[62] CHU00020779.01E-CHU00020781E at 779.01E.

[63] SDCRT-0087441-SDCRT-0087740 at 689.

[64] CHU00029175.01E-CHU00029178.02E at 176.01E

[65] CHU00029999.01E-CHU00030000.01E at 999.01E.

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> Orders for 21" CPT are rising. SDI Shenzhen factory is strategically reducing the 17"F CDT production volume; producing more 21"CPT in response.[66]

> [SDI] #1 [line] is 14/16/20/21 *fs* general production line; currently it stops producing 14" to produce more 20/21*fs*. #4 [line] is 14/15 *PF* and 15" CDT general production line. Currently it stops producing 15" CDT to increase production of 14" (160k). Furthermore, 20/21*fs* production capacity has already been adjusted from 130 [to] 200k/m according to 3Q's demands.[67]

> Orion: [] Since the Vietnam factory's 14" is not that profitable, 70% of the production line is planned be used to produce mainly 20" in 2Q.[68]

> In response to strong demand for 17" MF [CDT], [Toshiba] has planned to increase 17" MF's production to 250K/M.[69]

42.   Lastly, related to Irico's claim that I did not study demand-side substitutability across CRT products. Irico argues that there is a "lack of demand substitutability" because CRTs "made for one particular end use could not serve as functional substitutes for those intended for a different end use."[70] Irico presents a misleading view of demand substitutability. Important demand substitutability occurs at the end-user level, where consumers can substitute one CRT finished product for another. CRT monitors of various sizes (and other features), as well as CRT TVs of various sizes (and other features), serve the same functionality. A CRT monitor (or TV) of one size is a ready substitute for a CRT monitor (or TV) of another size. As I described in my Opening

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[66] CHU00014218.01E-CHU00014218.02E at 218.01E.

[67] CHU00030020.01E-CHU00030025E at 020.02E.

[68] CHU00036394.01E-CHU00036395.02E at 394.02E.

[69] CHU00028283E-CHU00028285E at 283E.

[70] Defendants' Opposition, 19.

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Report,[71] as well as above, manufacturers understood this and were able to change production across CRTs to meet the changes in demand which created a structured pricing for CRTs. Therefore, Irico's arguments related to demand substitutability are misguided and do not undermine my analysis of class-wide impact of the conspiracy.

B. Irico's Claims Regarding My Hedonic Analyses are Wrong

43.   Irico makes another misleading argument regarding my hedonic regression analysis, claiming that it shows lack of structure. Irico says that: "To obscure this wide variation […] Dr. Johnson simply takes an *average* of the R-squared values *across 13 years* and declares that 'the vast majority of the variability' is explained by something other than disparate impact from the alleged conspiracy."[72]

44.   This is another mischaracterization of my report. I did not limit my presentation of the results from my hedonic analysis to a simple average R-squared (or indeed, even present the simple average Irico claims). Rather, I displayed all the R-squared values that resulted from the 104 quarterly hedonic regressions in a chart and summarized them as follows: "The median R-squared for the CPT hedonic regressions was 96 percent and 83 percent for CDTs.[73] The R-Squared exceeded 0.7 in all but four of the 104 results."[74] The analysis supports my characterization and conclusion that the vast majority of the variability in prices in each quarter can be explained by CRT characteristics.

45.   Irico's also claims that "Combining all CPT sizes and all CDT sizes together in a single quarterly regression likely also served to obscure additional variation in the fit of the chosen variables."[75] This statement is both false (in no way did I combine "all CPT sizes and all CDT sizes together in a single quarterly regression") and

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[71] Johnson Report, 38-39.

[72] Defendants' Opposition, 21.

[73] The median value shows that 50% of the regressions had R-squares of that value or above.

[74] Johnson Report, 17.

[75] Defendants' Opposition, 21.

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incomprehensible (even had I done so, as a matter of econometrics the claim makes no sense).

46.   Irico apparently interprets the variability in the R-square values as "[showing] that impact was not common as to different product types and sizes over time,"[76] which is not a correct interpretation of these results. Variability in the R-square values from over 100 quarterly regressions is expected, at the very least, due to variations in the quarterly sales data and prices.

IV.   Irico's Criticisms of My Model of CRT Overcharges Are Unfounded; My Model Utilizes a Reliable Methodology and Provides a Valid Estimate of Damages

47.   Irico claims that my overcharge analysis is not capable of measuring damages due to the alleged harm because: "(1) it covers products that were never subject to the alleged conspiracy; (2) assumes but-for pricing that does not factor in mandatory price floors implemented by the Chinese government during the class period; and (3) covers years for which Irico could not be liable given their limited participation in any alleged conspiracy."[77] I address each of these claims below.

48.   *Claim 1: The overcharge model includes products that could not plausibly have been affected by the conspiracy.* Irico says that there was "a significant portion of CRT sizes and types for which no target prices were found and thus there is no plausible impact on purchasers of those particular CRTs." The premise for this argument is that the collusion was limited to the price target documents, and only those produced.[78]

49.   This premise is incorrect. As explained above, and in my Opening Report, the DPPs' allegations of collusion do not solely rest on the cartel's explicit efforts to set specific price target for CRTs. This is consistent with the evidence I have reviewed and described in detail in my Opening Report. In addition to setting target prices for

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[76] Defendants' Opposition, 21.

[77] Defendants' Opposition, 22.

[78] Defendants' Opposition, 22.

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CRTs, the collusive activities included extensive efforts to curtail production and capacity, which would elevate and maintain supra-competitive prices even if the absence of price target documents in certain periods and/or products indicated an absence of explicit price targeting for those periods and/or products.

50.   *Claim 2: The overcharge model fails to consider mandatory price floors that impacted key CPT sizes for all manufactures with production in China.* Irico claims that in 1998, the Chinese government introduced regulations related to the pricing of industrial products, including CRTs. Specifically, Irico claims that these regulations "prohibit[ed] both selling products below a producer's actual costs [] and below 'industrial average production costs.'" It claims that in 1999 the Chinese government "promulgated a notice that [] it would be investigating and publishing 'average industry production costs' for CRTs and color televisions."[79] Irico presents one document showing a directive from the Chinese Ministry of Information in April, 1999 with a chart of average industry production costs for 21" and 25" CPTs and color televisions published by the Chinese government[80] and another document showing a directive for 21" (regular flat), 25" (regular flat), and 29" (ultra-flat) CPTs in September, 2000.[81]

51.   These regulations have no bearing on the reliability of my overcharge model to measure class-wide damages. My overcharge model analyzes global CRT prices and, as I stated in my deposition, there is no reason to believe that these regulations would have had a measurable effect on actual global market prices (if any).[82] Moreover, as I stated in my deposition, there is no way of knowing whether these regulations would have been the same in the but-for world as they might have been modified in the face of lower market prices, either at the request of Irico or of other CRT product producers operating in China.[83] Irico provided no information or analysis of the

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[79] Defendants' Opposition, 23.

[80] Defendants' Opposition, 23 and Exhibit 37 at IRI-CRT-00031459.

[81] Defendants' Opposition, Exhibit 38, 5. Another directive in August, 2000 relates only to color TVs and not CRTs. Defendants' Opposition, Exhibit 36, 5.

[82] Johnson Deposition at 250:8-25.

[83] Johnson Deposition at 249:21-250:6.

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regulations, whether they were enforced or how they might have been impacted by the existence of the cartel.
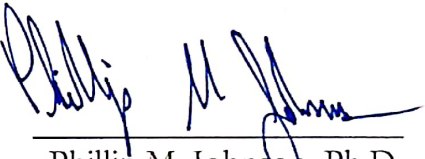
52.   Further, Irico provided no evidence that these regulations actually constrained its CRT prices or would have but for the conspiracy. First, it is unclear how long these regulations lasted and to what extent they were enforced. Second, the Chinese Government directives Irico provided suggest that the regulations were "Trial Measures" and had a limited scope (only referencing two CPT sizes in one directive in April, 1999 and three CPT sizes in another directive in September, 2000).

53.   I note also that such regulations, whether enforced or not, would be a facilitating factor in collusion because they might be used by one co-conspirator to deter its fellow conspirators from cheating on the cartel with low prices, by reporting "unacceptably low prices" of other CRT manufacturers to the government in order to support the cartel agreement.[84] As an economic matter, the possibility of government punishment of lower prices is an additional facilitating factor for the success of the cartel's efforts to keep prices above competitive levels.

54.   *Claim 3. The overcharge model provides no reliable way to isolate damages for the portions of the class period for which Irico Defendants Could Be Liable.* Irico claims that my overcharge model does not provide a "reliable method of calculating damages that resulted from Irico's evidenced participation […], casting a wide net to assume full overcharges from all sales by all defendants across the class period, and rendering it unreliable as a model for use against Irico."[85]

55.   The claim is wrong. My model does provide a reliable method of computing damages, not only for the entire Class Period, but also for any subperiod for which Irico might be found liable. My model finds an overcharge that varies across the Class Period (using the periods before and after the alleged conspiracy as a competitive

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[84] Defendants' Opposition, Exhibit 37 at IRI-CRT-00031459 ("In case where a manufacturer sells its products at the prices lower than the published industrial average production costs, causing market disorders and harming the interests of other manufacturers, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province, autonomous region and municipality directly under the Central Government.").

[85] Defendants' Opposition, 25.

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benchmark). Additionally, it estimates overcharges for CDTs and CPTs separately. The model estimates that the overcharges in 1995Q2 of the conspiracy were approximately 7.6 percent for CDTs, gradually increasing to 10.5 percent by mid-1996. For CPTs, the model estimates an overcharge of approximately 4.2 percent in 1995Q2, which increases to approximately 5.8 percent by mid-1996.[86] If Irico were to be found liable for damages starting in 1998 (or any other date), the appropriate estimate of overcharge from that date can be calculated.

I declare under penalty of perjury that the foregoing is true and correct.

Phillip M. Johnson, Ph.D.
March 4, 2022

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[86] See "par_80_output.xlsx" file in the work materials produced with my Opening Report.

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Appendix A: Examples of Production Facilities and Lines That Were Capable of Producing Multiple CRT Sizes and Types

Manufacturer	Country	Location	Line	CRTs Manufactured	
				CPT	CDT
(1)	(2)	(3)	(4)	(5)	(6)
1. BMCC	China	Beijing	#3	21/29	
2. CPT	China	Fuzhou	#1		14/15MINI
3. CPT	Malaysia	Selangor	#3	20/21/21PF	
4. CPT	Malaysia	Selangor	#4	20/21/21PF	
5. CPT	Malaysia	Selangor	#6	10/14	
6. CPT	Malaysia	Selangor	#6	10/15PF	
7. CPT	Malaysia	Selangor	#7	14/15PF	
8. CPT	Malaysia	Shahalam	#3	20/21	
9. Hitachi	China	Shenzhen	#3	29/33	
10. Hitachi	China	Shenzhen	#3	29PF/34FS/34SF	
11. Hitachi	Singapore	Total	#1		15/17
12. Hitachi	Singapore	Total	#2		17/19
13. Hitachi	USA	Greenville(SC)	#1	27/31/32	
14. IRICO	China	Xiangyang	#1	14/21PF	
15. IRICO	China	Xiangyang	#3	15PF/21PF	
16. IRICO	China	Xiangyang	#3	15PF/21PF/21Sus	
17. IRICO	China	Xiangyang	#4	15PFAK/21/21PF	
18. IRICO	China	Xiangyang	#7	25PF/29PF	
19. IRICO	China	Xiangyang	#8	25PF/29PF	
20. IRICO	China	Xiangyang	Plan #9	34PF28PFW//32PFW	
21. LPD	Austria	Lebring	#2		15/17
22. LPD	Brazil	Dos Campos	#3	14/20	
23. LPD	Brazil	Dos Campos	#3	20/21F	
24. LPD	China	Changsa	#1	25/25F/2R1F	
25. LPD	China	Changsa	#2	25/25F/21F	
26. LPD	China	Changsa	#4		15/17/17ez
27. LPD	China	Changsha	#4		15/17DF/17FST
28. LPD	China	Nanjing	#9		14/15
29. LPD	China	Nanjing	DL1	20/21F	
30. LPD	China	Nanjing	DL6		15/17
31. LPD	China	Nanjing	PL2	21/21RF/21Sus/25/25F	
32. LPD	China	Nanjing	PL2	25/21CV	
33. LPD	China	Nanjing	PL5	34RF/32PFW	
34. LPD	Czech	Hamice	#3	28W/32WF	
35. LPD	Czech	Hranice	#1	28/29RF	
36. LPD	France	Dreux	#1	24W/28W	
37. LPD	France	Dreux	#2	24W/24WF/28W	
38. LPD	Germany	Aachen	#3	32WF/36WF	
39. LPD	India	Malanpur	#1	14/21	
40. LPD	Indonesia	Jakarta	#2	20/21	
41. LPD	Indonesia	Jakarta	#2	20/21/21RF/21Sus	
42. LPD	Korea	Changwon	H-1	20/21/21F	
43. LPD	Korea	Gumi	F-1		17/19
44. LPD	Korea	Gumi	F-1		17/19/19ez
45. LPD	Korea	Gumi	F-2		17F/19F
46. LPD	Korea	Gumi	F-2	29SuS/32Sus	
47. LPD	Korea	Gumi	J	25F/29/29F	
48. LPD	Korea	Gumi	J	25F/29F	
49. LPD	Korea	Gumi	J-1	25F/29/29F	
50. LPD	Korea	Gumi	T		17F/19F
51. LPD	Korea	Gumi	T	17F/19F	
52. LPD	Korea	Gumi	W	29/29F/33/W:28/32	
53. LPD	Korea	Gumi	W	29/29F/34/W:28/32	
54. LPD	Mexico	Gomez	A	27V/32RFW/34RF	
55. LPD	Mexico	Gomez	A	27V/34RF	
56. LPD	UK	Durham	#1	17FS/21FS	
57. LPD	UK	Durham	#2	21/21F/25	
58. LPD	UK	Durham	#3	21/17	
59. LPD	UK	Wales	#1		15/17
60. LPD	USA	Ottawa	#3	25/27	
61. LPD	USA	Ottawa	#3	25V/27V	
62. LPD	USA	Ottawa	#4	25/27	
63. LPD	USA	Ottawa	#4	25V/27V	
64. LPD	USA	Ottawa	#6	25V/27V	
65. LPD	USA	Rauland	#1	19/20	
66. LPD	USA	Rauland	#2		15/17
67. LPD	USA	Rauland	#4	25/27	

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68. MTPD	China	Beijing	B-1	21/25F AK	
69. MTPD	China	Beijing	B-3	21/21PF/29PF	
70. MTPD	China	Beijing	B-5	29SF/28PFW	
71. MTPD	China	Beijing	B-6	29PF/34SF/34PF	
72. MTPD	China	Beijing	B-6	29PF/34SF/34PF/32PFW	
73. MTPD	China	Bejing	#1	14/29	
74. MTPD	China	Bejing	#3	21/29	
75. MTPD	Germany	Esslingen	#1	25/29/W:28	
76. MTPD	Germany	Esslingen	#1	28/29PF/28PFW/32PFW	
77. MTPD	Germany	Esslingen	#2	25/28	
78. MTPD	Indonesia	Bekasi	#1	14/20/21	
79. MTPD	Indonesia	Bekasi	#1	14/20/21/21F	
80. MTPD	Indonesia	Bekasi	DDI	20/21PF	
81. MTPD	Japan	Himeji	(B)	32PFW/36PFW/34PF	
82. MTPD	Japan	Himeji	(D)	28PFW/29PF	
83. MTPD	Japan	Takatsuki	#1	32PFW/36PFW	
84. MTPD	Japan	Takatsuki (高槻)	#2	33/W:32/36	
85. MTPD	Japan	Utsunomiya (宇都宮)	#1	25/W:24/28	21
86. MTPD	Malaysia	Selangor	#1	20/21/21F	
87. MTPD	Malaysia	Selangor	#2	10/15F/21	
88. MTPD	Malaysia	Selangor	#3	20/21	
89. MTPD	Malaysia	Selangor	#5	25F/29F	
90. MTPD	Malaysia	Sharh Alam	#2	10PF/21PF	
91. MTPD	Malaysia	Sharh Alam	#6	28PFW/32PFW	
92. MTPD	Thailand	Pathumthani	Ph-2	21PF/25PF	
93. MTPD	Thailand	Pathumthani	Ph-3	15PF/21PF	
94. MTPD	Thailand	Pathumthani	Ph-6	29PF/34FS/34SF/34PF	
95. MTPD	USA	Househeads	#1	34/38/34PF/38PF	
96. MTPD	USA	Troy	A-3	34/38	
97. MTPD	USA	Troy	A-3	34/38/34PF	
98. MTPD	USA	Troy	A-4	34PF/32PFW/36PFW	
99. MTPD	USA	Troy	A-4	34PF/38PF/32PFW/36PFW	
100. MTPD	USA	Troy (OH.)	#1	27/31	
101. MTPD	USA	Troy (OH.)	#3	32/35	
102. Mitsubishi	Canada	Midland	#1	25/27	
103. Mitsubishi	Canada	Midland	#2	19/20	
104. Mitsubishi	Japan	Kyoto	#1	25/26/28/29	
105. Mitsubishi	Japan	Kyoto	#2	29/33/W:28/32	
106. Mitsubishi	Japan	Kyoto	#3	33/37/42/WV:36	
107. Mitsubishi	Japan	Kyoto	#4		17/19/21NF
108. Mitsubishi	Japan	Kyoto	#6		19/21NF
109. Orion	China	Gonsan	#1		15/17
110. Orion	France	Longwy	#1	14/20	
111. Orion	Korea	Kumi	#2(Orico-1	29/29PF/32PFW	
112. Orion	Korea	Kumi	#3(Orico-7		17/19/19PF
113. Orion	Korea	Kumi	BSA		14/15
114. Orion	Korea	Kumi	BSC	14/20	
115. Orion	Korea	Kumi	BSL	20/21	
116. Orion	Korea	Kumi	O-7		17/19
117. Orion	Korea	Kumi	O-8	25/29	
118. Orion	Mexico	Mexicali	#1	20/21/21PF	
119. Orion	Mexico	Mexicali	#1	20/21PF	
120. Orion	Mexico	Mexicali	#3	25/27	
121. Orion	Mexico	Mexicali	#3	D:15/17	
122. Orion	Vietnam	Hanoi	#1	14/16/20/21	
123. Orion	Vietnam	Hanoi	#2	20/21/21PF	
124. Orion	Vietnam	Hanoi	#2	D:14/15	

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125. SDI	Brazil	Manaus	#1	20/21/21PF	17CDTRound
126. SDI	Brazil	Manaus	#1	20/21F	CDT
127. SDI	Brazil	Manaus	#2	14	14/15
128. SDI	China	SSDI	#4	25/25RF/ 29RF/ 29Sus	
129. SDI	China	Shenzhen	#1	20/21	
130. SDI	China	Shenzhen	#1	20/21/21F/21Sus	
131. SDI	China	Shenzhen	#1	20/21PF	
132. SDI	China	Shenzhen	#2		14/17
133. SDI	China	Shenzhen	#2-Add	25PF/29/29PF	
134. SDI	China	Shenzhen	#4		15/17F
135. SDI	China	Tianjin	#1	25/25F/29F	
136. SDI	China	Tianjin	#1	25/29	
137. SDI	China	Tianjin	#2		CDT15F/17F
138. SDI	China	Tianjin	#3	34F/29F	
139. SDI	China	Tianjing	#1	25/25PF/29/29PF	
140. SDI	China	Tianjing	#3	29PF/34PF	
141. SDI	Germany	Berlin	#1	20/21	
142. SDI	Germany	Berlin	#1	25/28/29PF	
143. SDI	Germany	Berlin	#1	25F/28	
144. SDI	Germany	Berlin	#2	21/25/29	
145. SDI	Germany	Berlin	#2	28PFW/29PF	
146. SDI	Germany	Berlin	#2	29F/28WF	
147. SDI	Hungary	Braniche	#1	20/21/21F	
148. SDI	Hungary	Braniche	#2	29F/29Sus/28WF 32WF/32Sus	
149. SDI	Hungary	Goed	#1	20/21/21PF	
150. SDI	Hungary	Goed	#2	25PF//29PF/32PFW	
151. SDI	Korea	Busan	#2		15/1717F
152. SDI	Korea	Busan	#4		17/19
153. SDI	Korea	Busan	#7	25/25F/29	
154. SDI	Korea	Busan	#7	25/25PF/29	
155. SDI	Korea	Busan	#7	25/29	
156. SDI	Korea	Busan	#8	28/29	
157. SDI	Korea	Busan	#8	29/29F/29Sus/ WF:28/32/32Sus	
158. SDI	Korea	Busan	#8	29/29PF/28PFW/32PFW	
159. SDI	Korea	Suwon	#1	10/10PF/7PRT	
160. SDI	Korea	Suwon	#1	10F/7PRT	
161. SDI	Korea	Suwon	#2		17F/19F/21/21F
162. SDI	Korea	Suwon	#2		CDT19F/20F
163. SDI	Korea	Suwon	#3		CDT19F/20F
164. SDI	Korea	Suwon	#4		15/17F
165. SDI	Korea	Suwon	#6	6/7PJT	
166. SDI	Malaysia	Selemban	#1	16/20/21/21PF	
167. SDI	Malaysia	Selemban	#1	20/21/21F	
168. SDI	Malaysia	Selemban	#3	20/21/21PF	
169. SDI	Malaysia	Selemban	#4	14/15F	15
170. SDI	Malaysia	Selemban	#4	14/15PF	15CDT
171. SDI	Malaysia	Selemban	#5		CDT15F/17F
172. SDI	Malaysia	Sembilan	#1	14/16	
173. SDI	Malaysia	Sembilan	#3	20/21	
174. SDI	Malaysia	Sembilan	#4	14/15	14
175. SDI	Mexico	Tijuana	#1	20/21	
176. SDI	Mexico	Tijuana	#1	25/25PF/27/29/29PF	
177. SDI	Mexico	Tijuana	#1	25/29/29F 32WF/32Sus	
178. SDI	Mexico	Tijuana	#2	20/21/21PF	
179. SDI	Mexico	Tijuana	#2	20/21F/25/29/25F	
180. SDI	Mexico	Tijuana	#2	25/27	
181. Thai-CRT	Thailand	Cholburi	#2	14/20	
182. Thai-CRT	Thailand	Cholburi	#3	20/21	
183. Thai-CRT	Thailand	Cholburi	#4	21/25/W:20	
184. Thai-CRT	Thailand	Cholburi	#5		15/17
185. Thai-CRT	Thailand	Chonburi	#2	20/21	
186. Thai-CRT	Thailand	Rayong	#5	14/15FAK	

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187. Thomson	China	Dongguan	#1	21/21PF/21Sus/25	
188. Thomson	China	Dongguan	#1	21/25	
189. Thomson	China	Dongguan	#2	21/25/25F	
190. Thomson	China	Dongguan	#3	21/25/29	
191. Thomson	China	Foushan	#2	29Sus/31PF/34FS/34PF/30PFW/32PFW	
192. Thomson	Italy	Anagni	#1	29PF/24W/28W/28PFW	
193. Thomson	Italy	Anagni	#2	25/28	
194. Thomson	Italy	Anagni	#3	28/29/33/36	
195. Thomson	Italy	Anagni	#3	34/32W/32PFW	
196. Thomson	Mexico	Mexicali	#2	27VPF/32V/32VPF	
197. Thomson	Mexico	Mexicali	#2	29/29PF/34	
198. Thomson	Poland	Piaseczno	#1	20/21	
199. Thomson	Poland	Piaseczno	#1	20/21/21Sus	
200. Thomson	Poland	Piaseczno	#2	20/21	
201. Thomson	Poland	Piaseczno	#2	21/21PF/25	
202. Thomson	Poland	Piaseczno	#3	21/25	
203. Thomson	Poland	Piaseczno	#3	28/29PF	
204. Thomson	USA	Marion	#1	19/20V	
205. Thomson	USA	Marion	#2	19/20V	
206. Thomson	USA	Marion	#4	25/27V	
207. Thomson	USA	Marion	#5	32/35/36V	
208. Toshiba	Indonesia	Jakarta	#1	14/20/21	
209. Toshiba	Japan	Fukaya (深谷)	#2		17/19
210. Toshiba	Japan	Himeji (姫路)	#2	25/28/29/W:29	
211. Toshiba	Japan	Himeji (姫路)	#3	25/37/W:28/32	
212. Toshiba	Thailand	Bangkadi	#1	21/21F/25/25F	
213. Toshiba	USA	Horsehead	#1	32/36	

Source: CHU00125257: CRT Line Status, November, 2001
BMCC-CRT000057539: CRT Line Status, July, 2004
BMCC-CRT000006384: CRT Line Status, November, 2005

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Exhibit 1
List of Additional Materials Relied Upon

Pleadings and Orders	**Date**
Irico Defendants' Opposition to Direct Purchaser Plaintiffs' Motion for Class Certification with Respect to the Irico Defendants	01/21/22

Expert Reports

Johnson, Phillip M.	11/19/21

Depositions and Exhibits

Johnson, Phillip M.	01/11/22

Publicly Available Materials

Hal R. Varian, Intermediate Microeconomics: A Modern Approach: 8th edition (New York: W.W. Norton & Company, Inc., 2010).

Suzanna De Boef and Luke Keele, "Taking Time Seriously," American Journal of Political Science 52, no. 1 (January 2008), 184-200.

Travis J. Lybbert and David R. Just, "Is Risk Aversion Really Correlated with Wealth? How estimated Probabilities Introduce Spurious Correlation," American Journal of Agricultural Economics 89, issue 4 (November 2007), 964-979.

Documents

Defendants' Opposition, Exhibit 36

Defendants' Opposition, Exhibit 37

Defendants' Opposition, Exhibit 38

Other

Backup Material to Expert Report of Robert Willig "crt_target_prices.dta" "Paragraph 22.do"	09/10/13